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Force of darkness scatters universe

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 By Stephen Cauchi
 Science Reporter

Our universe is getting more and more mysterious. It is not only older than previously thought, according to a study, but it is apparently growing faster than ever.

British and American researchers have reported in the latest issue of *Science* that the universe is at least 11.2 billion years old, up from the previous estimate of 10 billion years.

This confirms that the "big bang", which gave birth to the universe and sent galaxies flying into the void, isn't petering out but accelerating.

Astronomers believe a mysterious force called dark energy, first mooted by Albert Einstein in 1917, is the culprit.

"This finding provides strong support for a universe which is dominated by a kind of energy we've never directly observed," said a researcher, Brian Chaboyer of Dartmouth College in the US.

"Observations... have suggested for a few years that dark energy dominates the universe, and our finding provides independent evidence that the universe is dominated by this type of energy we do not understand."

According to the *Science* article, Assistant Professor Chaboyer and his American colleague Lawrence Krauss are almost certain the universe is at least 11.2 billion years old and possibly as old as 20 billion. If so, the universe is not only expanding, but doing so more quickly than ever. In 1929, American astronomer Edwin Hubble discovered that galaxies were moving away from each other - the universe was growing.

By retracing the movements of galaxies, astronomers could calculate when the big bang happened, putting the universe's age at nine billion

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years.

But many stars seem far older than this, a fact that has worried astronomers for decades. Estimates in 1996 and 1997 of the age of the oldest stars were barely compatible with the universe's supposed age.

In their latest research, Professors Chaboyer and Krauss have worked out that groups of stars in our own galaxy called globular clusters are at least 10.4 billion years old.

Allowing for the time it takes to form a star, the universe has to be at least 11.2 billion years old - a lot older than nine billion years.

The only way to explain the discrepancy is to reason that the universe once expended more slowly than it does now. And what is causing the universe to enlarge more quickly now? Dark energy.

Professors Chaboyer and Krauss noted in *Science* that "the three fundamental observables in cosmology" - the age, distance, and geometry of the universe - "now independently support the case for a dark-energy dominated universe".

While no one knows exactly what dark energy is, many physicists believe it is linked to the vacuum found in space.

"Determining the specific nature of this exotic energy that dominates the universe will require much observational and theoretical effort," the pair write in *Science*.



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